

Professor SUN, BAOQUAN

Department of Materials Science and Engineering, Faculty of Innovation Engineering
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Academic Qualification

Ph.D. in Chemistry Materials, Department of Chemistry, Tsinghua University
B.S. in Chemical Engineering, Department of Chemical Engineering, Qingdao University of Science and Technology

Teaching Area

Materials Chemistry
New Energy Materials and Technology

Research Area

- (1) Flexible Electronics, Conjugated Polymer, Nanostructured Semiconductor Materials, Colloidal Quantum Dots
- (2) Charge Separation and Transport; Interface Engineering for High Efficient Optoelectronic Devices
- (3) Solar Cell; Silicon Solar Cell, Organic Solar Cell
- (4) Light emitting diode
- (5) Electronics ink

Working Experience

2002.8-2007.4 Research Associate in Optoelectronics, Cavendish Laboratory (Physics), Cambridge University (Advisor Sir Richard Friend), Cambridge, United Kingdom
2007.5-2009.01 Research Scientist in C-PCS, Los Alamos National Laboratory (Hosted by Dr. Victor Klimov), NM, USA
2009.01-Present Professor in Institute of Functional Nano & Soft Materials (FUNSOM), Soochow University, Suzhou, China

Academic Publication (selected)

Shao, B.; Xing, C.; Song, Y.; Jiang, C.; Bai, G.; Song, T.; Liu, R.; Wang, Y.; Sun, B. Boosting electrical output of nanostructured silicon hydrovoltaic device via cobalt oxide enabled electrode surface contact. *Nano Energy* 2023, 106, 108081.
Zhang, C.; Wang, M.; Jiang, C.; Zhu, P.; Sun, B.; Gao, Q.; Gao, C.; Liu, R. Highly adhesive and self-healing γ -PGA/PEDOT:PSS conductive hydrogels enabled by multiple hydrogen bonding for wearable electronics. *Nano Energy* 2022, 95, 106991.
Song, Z.; Ge, C.; Song, Y.; Chen, Z.; Shao, B.; Yuan, X.; Chen, J.; Xu, D.; Song, T.; Fang, J.; Wang, Y.; Sun, B. Synergistic Solar-Driven Freshwater Generation and Electricity Output Empowered by Wafer-Scale Nanostructured Silicon. *Small* 2022, n/a, 2205265.
Shao, B. B.; Wu, Y. F.; Song, Z. H.; Yang, H. W.; Chen, X.; Zou, Y. T.; Zang, J. Q.; Yang, F.; Song, T.; Wang, Y. S.; Shao, M. W.; Sun, B. Q. Freestanding silicon nanowires mesh for efficient electricity generation from evaporation-induced water capillary flow. *Nano Energy* 2022, 94, 106917.

Jiang, C.; Zhang, G.; Hong, Z.; Chen, J.; Li, Y.; Yuan, X.; Lin, Y.; Yu, C.; Wang, T.; Song, T.; Wang, Y.; Sun, B. Colored Silicon Heterojunction Solar Cells Exceeding 23.5% Efficiency Enabled by Luminescent Down-Shift Quantum Dots. *Advanced Materials* 2022, n/a, 2208042.

Zou, Y.; Teng, P.; Xu, W.; Zheng, G.; Lin, W.; Yin, J.; Kobera, L.; Abbrent, S.; Li, X.; Steele, J. A.; Solano, E.; Roeffaers, M. B. J.; Li, J.; Cai, L.; Kuang, C.; Scheblykin, I. G.; Brus, J.; Zheng, K.; Yang, Y.; Mohammed, O. F.; Bakr, O. M.; Pullerits, T.; Bai, S.; Sun, B.; Gao, F. Manipulating crystallization dynamics through chelating molecules for bright perovskite emitters. *Nature Communications* 2021, 12, 4831.

Wang, Y.; Zhang, G.; Wu, H.; Sun, B. Simultaneously Harvesting Friction and Solar Energy via Organic/Silicon Heterojunction with High Direct-Current Generation. *Adv Energy Mater* 2021, 11, 2100578.

Shao, B.; Song, Z.; Chen, X.; Wu, Y.; Li, Y.; Song, C.; Yang, F.; Song, T.; Wang, Y.; Lee, S. T.; Sun, B. Bioinspired Hierarchical Nanofabric Electrode for Silicon Hydrovoltaic Device with Record Power Output. *ACS Nano* 2021, 15, 7472-7481.

Liang, D.; Dong, C.; Cai, L.; Su, Z.; Zang, J.; Wang, C.; Wang, X.; Zou, Y.; Li, Y.; Chen, L.; Zhang, L.; Hong, Z.; El-Shaer, A.; Wang, Z. K.; Gao, X.; Sun, B. Unveiling Crystal Orientation in Quasi-2D Perovskite Films by In Situ GIWAXS for High-Performance Photovoltaics. *Small* 2021, 17, e2100972.

Li, P.; Fang, J.; Wang, Y.; Manzhos, S.; Cai, L.; Song, Z.; Li, Y.; Song, T.; Wang, X.; Guo, X.; Zhang, M.; Ma, D.; Sun, B. Synergistic Effect of Dielectric Property and Energy Transfer on Charge Separation in Non-Fullerene-Based Solar Cells. *Angewandte Chemie International Edition* 2021, 60, 15054-15062.

Wu, T.; Li, J.; Zou, Y.; Xu, H.; Wen, K.; Wan, S.; Bai, S.; Song, T.; McLeod, J. A.; Duhm, S.; Gao, F.; Sun, B. High-Performance Perovskite Light-Emitting Diode with Enhanced Operational Stability Using Lithium Halide Passivation. *Angewandte Chemie International Edition* 2020, 59, 4099-4105.

Wang, R.; Wang, Y.; Wu, C.; Zhai, T.; Yang, J.; Sun, B.; Duhm, S.; Koch, N. Direct Observation of Conductive Polymer Induced Inversion Layer in n-Si and Correlation to Solar Cell Performance. *Advanced Functional Materials* 2020, 30, 1903440.

Qin, Y.; Wang, Y.; Sun, X.; Li, Y.; Xu, H.; Tan, Y.; Li, Y.; Song, T.; Sun, B. Constant Electricity Generation in Nanostructured Silicon by Evaporation-Driven Water Flow. *Angew Chem Int Ed Engl* 2020, 59, 10619-10625.

Liu, Y.; Cai, L.; Xu, Y.; Li, J.; Qin, Y.; Song, T.; Wang, L.; Li, Y.; Ono, L. K.; Qi, Y.; Sun, B. In-situ passivation perovskite targeting efficient light-emitting diodes via spontaneously formed silica network. *Nano Energy* 2020, 78, 105134.

Kuai, L.; Li, J. N.; Li, Y. J.; Wang, Y. S.; Li, P. D.; Qin, Y. S.; Song, T.; Yang, Y. G.; Chen, Z. Y.; Gao, X. Y.; Sun, B. Q. Revealing Crystallization Dynamics and the Compositional Control Mechanism of 2D Perovskite Film Growth by In Situ Synchrotron-Based GIXRD. *Acs Energy Letters* 2020, 5, 8-+.

Yuan, Z.; Miao, Y.; Hu, Z.; Xu, W.; Kuang, C.; Pan, K.; Liu, P.; Lai, J.; Sun, B.; Wang, J.; Bai, S.; Gao, F. Unveiling the synergistic effect of precursor stoichiometry and interfacial reactions for perovskite light-emitting diodes. *Nat Commun* 2019, 10, 2818.

Wu, C.; Wu, T.; Yang, Y.; McLeod, J. A.; Wang, Y.; Zou, Y.; Zhai, T.; Li, J.; Ban, M.; Song, T.; Gao, X.; Duhm, S.; Siringhaus, H.; Sun, B. Alternative Type Two-Dimensional-Three-Dimensional Lead Halide Perovskite with Inorganic Sodium Ions as a Spacer for High-Performance Light-Emitting Diodes. *ACS Nano* 2019, 13, 1645-1654.

Tan, Y. S.; Li, R. Y.; Xu, H.; Qin, Y. S.; Song, T.; Sun, B. Q. Ultrastable and Reversible Fluorescent Perovskite Films Used for Flexible Instantaneous Display. *Advanced Functional Materials* 2019, 29, 1900730.

Liu, Y.; Cheng, P.; Li, T.; Wang, R.; Li, Y.; Chang, S. Y.; Zhu, Y.; Cheng, H. W.; Wei, K. H.; Zhan, X.; Sun, B.; Yang, Y. Unraveling Sunlight by Transparent Organic Semiconductors toward Photovoltaic and Photosynthesis. *ACS Nano* 2019, 13, 1071-1077.

Liu, H.; Tan, Y.; Cao, M.; Hu, H.; Wu, L.; Yu, X.; Wang, L.; Sun, B.; Zhang, Q. Fabricating CsPbX₃-Based Type I and Type II Heterostructures by Tuning the Halide Composition of Janus CsPbX₃/ZrO₂ Nanocrystals. ACS Nano 2019, 13, 5366-5374.

Li, P.; Mainville, M.; Zhang, Y.; Leclerc, M.; Sun, B.; Izquierdo, R.; Ma, D. Air-Processed, Stable Organic Solar Cells with High Power Conversion Efficiency of 7.41. Small 2019, 15, e1804671.

Professional Certification and Awards

2015-, pss-physica status solidi (a) (WILEY-VCH IF 3.7) Editorial Board Member, WILEY-VCH, Germany

2021-, Nanomaterials (IF, 5.1), Editorial Board Membe, MDPI

2019-, SN Applied Science, Editorial Board Membe, Springer, German

2015-, Frontiers Optics and Photonics, Editorial Board Membe, Lausanne, Switzerland

2020-, Frontiers in Electronics, Editorial Board Membe(Link), Lausanne, Switzerland

2020-, Coating, Editorial Board Membe), Basel, Switzerland